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To: Examiner Virginia Monoharan Fax: (703) 872-9306
From: Mag Chappuis Date: December 31, 2003
E-mail: Mchappuis@atmi.com Pages: 13
Re: Copy of March 21, 2003 Office Action cc:
in U.S. Patent Application No.
10/015,326

Dear Examiner Manoharan:

As requested, please find enclosed a copy of the March 21, 2003 Office Action in U.S. Patent Application No. 10/015,326.

Please call 203-794-1100 ext. 4184 if there are any problems with this transmittal.

Maggie Chappuis
ATMI, Inc.
7 Commerce Drive
Danbury, CT 06810
203-794-1100 (telephone)
203-797-2544 (facsimile)
ATMI Docket: ATM-515

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/015,326	12/13/2001	Chongying Xu	ATMI - 515	2946

2344K 7540 03/21/2003

INTELLECTUAL PROPERTY / TECHNOLOGY LAW
PO BOX 14329
RESEARCH TRIANGLE PARK, NC 27709

EXAMINER

MANOHARAN, VIRGINIA

ART UNIT

PAPER NUMBER

1764

DATE MAILED: 03/21/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Intellectual Property/Technology Law

File: 2971-515 DOCKETED

WFO Date: 2/11 (Initials) CJH 11 (Initials) Assigned Atty: M

ACTION REQUIRED	DEADLINE
3 mo. Response	6/23/03
6 mo. Resp.	9/22/03

PTO-90C (Rev. 07-01)

Office Action Summary

Application No.

10/015,328

Applicant(s)

XU ET AL

Examiner

Virginia Manoharan

Art Unit

1764

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) 30-46 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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Applicant's election with traverse of Group I, claims 1-29 in Paper No. 6 is acknowledged. The traversal is on the ground(s) that ". all claims have in common a purification of the cyclosiloxane composition by the absorbent contacting and/or azeotropic distillation techniques. Accordingly, these Group I, II, and III claim species cannot be considered "independent" of one another, and are clearly interrelated and interdependent, not "independent and distinct".....The interdependence of these aspects of the invention is confirmed—indeed, it is mandated—by the description requirements of 35 USC 112 which compel disclosure of all three aspects of the invention in the one application which Applicants have filed, since the "product-by-process" composition of the Group III claims under 112 must satisfy the "how to make" (Group I method of making claims) and "how to use" (Group II CVD method of use claims) requirements of the statute..."

This is not found persuasive because while all the claims have in common the purification of the cyclosiloxane composition by the absorbent contacting and/or azeotropic distillation techniques, however, the Group II invention, e.g., relate to a CVD method of depositing a low k thin film on a substrate from a cyclosiloxane precursor which CVD method further comprises reaction and plasma enhancement, noting claims 31-44. Thus, unlike the Group I invention directed primarily to a physical unit of operation, the Group II includes also a reaction process.

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Moreover, while the product of Group III invention is made by the process as claimed e.g., in claim 45, however, the product can also be made by other processes other than the process/method defined in the Group I invention.

Furthermore, in the instant case, there is a burden in searching the claimed inventions. Class 252, for example, is a mandatory field of search for the group III invention, but is not required to be searched for the group I & II inventions. Likewise, classes 427, 438, 437, 148, and etc., are required to be searched for the group II invention, but these classes are not required to be searched for the product claims in the group III inventions, and the purification or separation process in group I. Besides, class 203 (where the elected invention is classified is directed only to process claims). There are no composition(s) or product(s) searches in class 203. The product is searched and classified in a different area of the USPTO classification system, e.g., class 252. Likewise, the method of depositing a low dielectric constant in a thin film substrate belongs to a different class i.e., class 427 of the USPTO classification system. The requirement is still deemed proper and is therefore made FINAL.

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors e.g. typographical, grammar, idiomatic, syntax and etc. Applicants' cooperations are requested in correcting any errors of which applicants may become aware in the specification.

Claims 1-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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a. The steps (1) and (2) in the Markush grouping recited e.g. in claims 1 and 29 are directed to two unrelated, different units of operations, i.e., to absorption and distillation.

While the process of distillation effects separation of a substance mixture according to boiling characteristics, the process of absorption effects separation of substances according to the type of the class of material and/or by the different absorbability of the components, not according to the boiling characteristics as does distillation.

b. For the combination (3), there is no tie-in between step (1) and step (2). The product from step (1) is also not connected or correlated to step (2) and vice versa.

c. The used of abbreviations in the claims is improper. For example "CVD" in claims 1 and 2. Initially identifying the material followed by the abbreviation in parenthesis obviates this rejection.

d. The inconsistent used of terminology in the claims is improper such as e.g., "optionally at least one other impurity" in claim 1, line 4; " or optionally at least one impurity in line 1, as opposed to "optionally impurity" in line 5.

In claim 13, the "adsorbent" in claim 13 should be—adsorbent bed material--.

e. The "n" in [Sio]_n recited in claim 1, (2), was not specified in the claim.

f. The process steps (1) and (2) are already covered in claim 1, claimed twice and/or at odds with claim 1, steps (1) and (2)?

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- g. An "azeotropic mixture" is normally defined by its composition and pressure, but which parameters are not given in the claims. See e.g., claim 1, (2).
- h. It is unclear what "said impurity" is being referred to in claims 2-4, i.e., whether the initially recited "at least one impurity" or "the at least one other impurity".
- i. It is not clear whether the "an absorbent bed material" in claim 8, line 2, is the same or different from the "an adsorbent bed material" initially in claim 1, line 3. (Underlinings Supplied).
- j. The claimed "said drying agent" in claim 10 lacks antecedent basis for support in the claims. The same hold true for claims 11, 12, 14 and 17.
- k. The decantation in claim 16 is at odds with the distillation in combination of (1) and (2) for (3) step.
- l. Regarding claim 10, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over McEntee (4,127,598) or Tsukuno et al (5,312,947) in view of Rossmly et al (4,087,448).

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Either McEntee or Tsukuno et al discloses substantially the process as claimed.

See e.g., Fig. 1, Part I, col. 5, lines 30-38 and the claims at cols. 17-20 of McEntee; and at col. 6, lines 38-43 and in Example 7 at col. 10 of Tsukuno. The process of McEntee or Tsukuno differs from the claimed invention in that claim 1, for example, recites in step (2), "distilling a starting mixture comprising at least one $[\text{SiO}]_n$ cyclosiloxane CVD precursor, in the presence of an azeotropic component, so as to form an azeotropic mixture with the water contained in said starting mixture; in order to produce (A) a distillate fraction comprising water and the azeotropic component and (B) a balance fraction comprising a purified cyclosiloxane precursor, whereby said balance fraction (B) is substantially reduced in water relative to said starting mixture..."

However, said step is conventionally done in the art as taught, e.g. in Example 2, col. 8 and col. 9 of the Rossmly et al reference.

To incorporate Rossmly's process to the process of either McEntee or Tsukuno would have been obvious to one of ordinary skill in the art inasmuch as McEntee for e.g., suggests a purification process which includes distillation. Note. e.g., col. 9, lines 38-63 and col. 12.

The levels of impurity and water in claims 18-19 and 20-21 respectively; the temperatures in claims 26-28 are deemed to be result-effective-variables which ordinarily are within the skilled of the art.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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- a. Imai et al discloses a purification method including the combination of adsorption and distillation
- b. Holm et al discloses utilizing an adsorbing bed for the feed cyclopolydiorganosiloxane material.
- c. EP '665 discloses a siloxane purification method.
- d. Perry et al discloses a method for the purification of cyclic siloxanes including drying with agents such as calcium chloride molecular sieves and etc.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to V. Manoharan whose telephone number is (703) 308-3844. The examiner can normally be reached on Tuesday–Friday from 7:30 a.m. to 6:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (703) 308-6824. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9311 for regular communications and (703) 308-0651 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

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V. Manohara/dh
March 19, 2003

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